



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

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Applicant: Michael Lynn Hinds

Examiner: Roger L. Pang

Serial No.: 09/881,115

Group Art Unit 3681

Filed: 06/14/2001

(Atty. Ref. No. 15745-US)

For: MAGNETIC PROTECTION FOR HYDRAULIC SEAL

Moline, IL 61265

02 February 2004

**APPEAL BRIEF**

The Honorable Commissioner  
of Patents and Trademarks  
Washington, D.C. 20231  
Sir:

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**Real Party in Interest**

The real party in interest is Deere & Company to whom this application was assigned by the applicant per the assignment document recorded in the United States Patent and Trademark Office on 06/14/2001 at REEL/FAME 011917/0657.

**Related Appeals and Interferences**

There are no related appeals or interferences.

**Status of Amendments**

A first amendment, filed on 09 December 2002, was entered in its entirety and considered in a first Final Rejection, dated 22 April 2003 and in a second Final Rejection, dated 21 November 2003.

**Status of Claims**

Claims 1-16 are pending in this application.

Claims 1 and 9 are rejected.

Claims 2-8 and 10-16 are objected to as being dependent upon a rejected

base claim.

This appeal is from the rejection of claims 1 and 9.

A copy of the appealed claims is set forth in the attached Appendix.

### **Summary of the Invention**

The present invention, as defined in the appealed claims, resides in the combination of: 1) a gear box having a low section having a bottom wall, a rotatable shaft extending through the bottom wall and being coupled to gearing, and a seal located for preventing oil from leaking along an interface including a surface section of the shaft where it enters the bottom wall, with 2) a contaminant collector having a magnetic characteristic mounted in the gear box in a location closely adjacent a top surface of the seal so as to intercept and collect ferric contaminants before they engage the seal.

Referring to FIGS. 1, there is shown a typical transmission 10 used for driving the cutting blades 22 of a pair of base cutting assemblies 18 of a sugar cane harvester. The gear box 12 of the transmission includes a shallow, horizontal upper section 14 which is joined to a pair of well sections 16.

Referring now also to FIGS. 2 and 3, it can be seen that each of the base cutting assemblies 18 includes a vertical drive shaft 20 which extends upwardly through a bottom wall of a given well section and 16 has an upper end section supported for rotation in an upper wall of the gear box 12. Located in the upper section 14 of the gear box 12, and respectively mounted to the tops of the drive shafts 20, are gears 32 and 34, these gears being respectively meshed with a pair of meshed idler gears 32. Respectively located about the shafts 20 and pressed into respective openings provided in the bottoms of the gear box well sections 16 are a pair of sleeves 48. Provided for sealing the interface between each shaft 20 and the associated sleeve 48 is a seal 52 made of an elastomeric material. Pressed onto each shaft 20 at a location just above the seal 52 is a contaminant collector 52.

Referring also to FIG. 4, it can be seen that each contaminant collector 52 is in the form of a ring 56, which is U-shaped in vertical cross section, whereby a channel is formed. The bight of the channel is provided with a plurality of angularly spaced holes 60 to permit the flow of oil through them. Located within the channel and fixed to the bight at locations between the holes 60 are a plurality of magnets 58.

In operation, any ferric contaminants which result from gear wear, for

example, will gravitate into the wells 16 and be attracted by the magnets 58 before reaching the seals 52. This will prevent the seals 52 from being abraded by contaminants, which, in the absence of the contaminant collectors 54, would be carried about by the rotating drive shafts 20 at their respective interfaces with the associated seal 52.

### Issue

1. Are claims 1 and 9 unpatentable under 35 U.S.C. 103(a) as being obvious over applicant's prior art admission in view of Teske?

### Grouping of the Claims

Rejected claims 1 and 9 are each independent claims.

### Arguments as to the Issue

#### Issue

It is submitted that the rejection of claims 1 and 9 as being unpatentable under 35 U.S.C. 103(a) as being obvious over applicant's prior art admission in view of Teske is untenable.

Specifically, among other structure, claims 1 and 9 each set forth a known environment including a gearbox having a low section (cl. 1) or well (cl. 9) provided with a bottom wall, a drive shaft extending through the bottom wall and coupled to gearing and a seal located for preventing oil from leaking along the surface of the shaft where it enters the gear box. In combination with this known structure is claimed a contaminant collector having a magnetic characteristic and being mounted in the gear box **at a location above and closely adjacent a top surface of the seal** so as to intercept and collect ferric contaminants **before they engage the seal**.

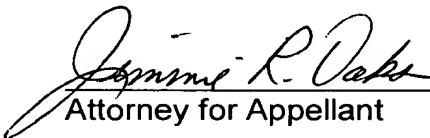
Teske, as depicted in FIG. 1, discloses a shaft 13 extending through a bore 12 provided in a machine component, which apparently may be a housing containing lubricant. A **seal 15** is interposed between the shaft 12 and a wall of the bore and includes a **magnetic sealing ring 16** which is in direct engagement with a shoulder 19 of the rotating shaft 12 and thus **performs a sealing function**. If it is assumed that Teske would have made it obvious to have substituted the seal 15 for applicant's claimed seal, then the problem still exists that some of the contaminants attracted to the seal 15 will be acted on by the rotating shaft 12 and cause the seal 15 to be

abraded, thus resulting in a decrease in the life of the seal. **In contrast**, in applicant's claimed device the magnetic contaminant collector is positioned above the seal 52 for intercepting ferric contaminants before they reach the seal 52.

For the reasons stated above, appellant respectfully requests that the Examiner's rejection of claims 1 and 9 be reversed.

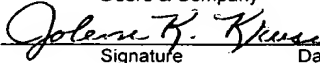
Please note that on or about 07 July 2003 (this is the date stamped on the self-addressed postcard sent in with the Appeal Brief) appellant filed an appeal brief with respect to the above-identified application and appellant instructed that the fee for filing the appeal brief be charged against Deposit Account 04-0525. **Thus, it is respectfully submitted that no further fee should be due as a result of filing this paper and appellant requests that the previously charged fee be applied here.** In the event that an additional amount is required because of fee increases, the additional amount may be charged against Deposit Account 04-0525. Two duplicates of this page are enclosed.

Respectfully,

  
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## **APPENDIX**

### **Claims under Appeal**

1. In a gearbox containing gearing and having a low section having a bottom wall, a rotatable drive shaft extending through said bottom wall and being coupled to said gearing, and a seal located for preventing oil from leaking along an interface including a surface section of the shaft where it enters said bottom wall of the gearbox, the improvement comprising: a contaminant collector having magnetic characteristics being mounted in said gearbox in a location closely adjacent a top surface of said seal so as to intercept and collect ferric contaminants before they engage the seal.

9. In a sugar cane base cutter assembly including a gearbox provided with an upper, horizontal section extending between and joining a pair of depending wells, each well having a bottom wall, an upper drive shaft section of a base cutter leg being rotatably mounted in each bottom wall, and a seal being located on each shaft section at an associated bottom wall for preventing leakage of oil from said gearbox along the shaft section, the improvement comprising: a contaminant collector having a magnetic characteristic being mounted above and closely adjacent each seal so as to intercept ferric contaminants settling towards the associated seal.